CPSC156a: Second Exam
December 4, 2003

Instructions: Answer exactly five of the following six questions. Do not answer all six. If you do answer all six, the first five answers in your blue book(s) will be graded, and the sixth will be ignored.

Please remember to put your name and email address on the cover of your blue book(s). Also, please take care to write legibly in order to ensure that your exam can be graded promptly and accurately.

Question 1 (20 points): Security

(a) (9 points) For three points each, define *confidentiality*, *integrity*, and *availability*.
(b) (4 points) Recall the anecdote in Morrow Long's lecture on network security about the embarrassment suffered by both Princeton and Yale when people in the Princeton admissions office gained access to computers in the Yale admissions office and were able to read applicants' files. What network-security mistake on the part of Yale's admissions office allowed this to happen?
(c) (2 points) True or False: When deciding whether or not to *authorize* a request that has been transmitted over the Internet, the security system on a networked computer must first establish and verify the *identity* of the entity that sent the request.
(d) (2 points) True or False: One of the basic reasons that Internet security is difficult is that the ARPANET protocols were originally designed for openness and flexibility, not for security.
(e) (3 points) Which of the following spam-fighting proposals is most closely analogous to electronic postage?
    (i) Using header and text analysis to filter out incoming spam
    (ii) Forcing email senders to prove that they are humans
    (iii) Forcing email senders to prove that they've used some minimum amount of computational resources per recipient per message
    (iv) All of the above

Question 2 (20 points): Open Source and Peer Production

(a) (4 points) For two points each, give two examples of Internet-based companies that have very successfully leveraged peer production.
(b) (3 points) In Benkler's vision, the success of a peer-produced project is limited by
    (i) the extent to which the project exhibits modularity, fine granularity, and low integration costs.
    (ii) the overall technical complexity of the project.
    (iii) the ability of the peer group to enforce its property rights.
    (iv) the ability to develop an adequate authorization system to manage project participation.

(c) (6 points) For three points each, identify two types of software distribution in which the user gets a working version of the program for free but does not necessarily agree to an open-source license.
(d) (2 points) True or False: All open-source software is copylefted.
(e) (5 points) Recall that workers in peer-produced projects, who may range from developers of open-source software to reviewers of academic journal articles to slashdot contributors, are neither paid for their work nor ordered to do it by people above them in organizational hierarchies. Give two reasons that they work on these projects anyway.

Question 3 (20 points): Digital Content Distribution I

(a) (3 points) For one point each, match the p2p service on the left with the system architecture on the right that most closely describes it.

Napster	Hybrid
Gnutella	Centralized matching and peer-to-peer file sharing
Kazaa	Pure peer-to-peer

(b) (3 points) The main source of inefficiency in the original Gnutella was
  (i) overloaded servers.
  (ii) fuzzy text matching.
  (iii) query flooding.
  (iv) none of the above.
(c) (4 points) Kazaa is a p2p file-sharing system often used to infringe music-distributors' copyrights. However, use of Kazaa is not illegal. Why not?
(d) (4 points) What is the difference between copyright infringement and DMCA violation?
(e) (6 points) For three points each, give two reasons that the prosecution of Dimitri Sklyarov for DMCA violation was controversial.

Question 4 (20 points): Digital Content Distribution II

(a) (3 points) Which of the following models for online content distribution does not incorporate traditional per-copy, royalty-based compensation for artists?
  (i) iTunes
  (ii) Street Performer
  (iii) the new Napster
  (iv) all of the above
(b) (6 points) For two points each, what are the three major "enforcers" that support a content-distribution business?
(c) (3 points) The largest share of record companies' costs in the production of popular-music CDs is attributable to
  (i) first-copy.
  (ii) manufacturing.
  (iii) marketing and sales.
  (iv) licensing and profits.

(d) (8 points) For four points each, give two basic differences between DVD-based movie distribution and CD-based music distribution that help explain why the former is currently a much more successful business than the latter. You may give technological differences, business-model differences, or differences that combine both technological and business aspects.

Question 5 (20 points): Online Privacy

(a) (2 points) True or False: Privacy laws in the US are usually sector-specific, whereas those in the European Union countries are comprehensive.
(b) (6 points) For two points each, give three of the Fair Information Principles proposed by the OECD (Organization for Economic Cooperation and Development).
(c) (3 points) Which of the following technologies may both improve the PC-user experience and compromise PC-user privacy?
    (i) Cookies
    (ii) Automated file back-up managed by the IT staff of the user's organization
    (iii) Customer profiles maintained by Internet-accessible retailers
    (iv) All of the above
(d) (3 points) Recall that "public records" may include birth, death, marriage, divorce, arrest, tax, home-ownership, and occupational-certification records, depending on which state's or country's laws and practices apply. Why is the practice of making public records "open to inspection by any person" potentially more problematic now than it used to be?
(e) (6 points) A consumer who wants to buy something about which he or she is embarrassed may consider buying it from an Internet-accessible seller or going to a brick-and-mortar store. What are the advantages and disadvantages of both options from a privacy point of view?

Question 6 (20 points): Copyright and Technical Protection

(a) (3 points) Recall that Article I, Section 8, Clause 8 of the US Constitution empowers Congress to create copyright law. What is the purpose of copyright, according to this Constitutional clause?
(b) (6 points) For two points each, give three of the exclusive rights that US copyright law grants to copyright owners.
(c) (3 points) What is the "first-sale rule" of US copyright law?
(d) (5 points) **The Digital Dilemma** makes the following point about digital works and the way they are used on the Internet: "*Content Liberated from Medium*: Information in digital form is largely liberated from the medium that carries it. When information is sent across networks, there is no need to ship a physical substrate; the information alone flows to the recipient." How does the fact that digital documents are "content liberated from medium" on the Internet make the first-sale rule potentially less appropriate for digital works than it has been for analog works?

(e) (3 points) Technical-protection systems (TPSs) are highly imperfect enforcers of copyright law in the digital realm. The most important technical reason for this imperfection is currently that

(i) users do not understand copyright law.

(ii) users are fundamentally unwilling to obey copyright law.

(iii) encryption systems are very hard to use.

(iv) the general-purpose computers into which digital copyright works are delivered are programmable. Thus TPSs are inherently circumventable, at least by experts.